

WO 2004/111593

PCT/NO2004/000169

Patent claims

- 5 1. A device for measuring pre-stressing force in a bolt/nut connection, comprising a screw nut that is provided with a sensor means for sensing the pre-stressing force, characterised in that the nut (1) is of standard design and that the nut itself constitutes a sensor body in that, in the outer peripheral surface (2) of the nut, at a chosen distance from the abutting surface of the nut (1) against the support (5), there is machined at least
10 one recess (3) in which there is placed a sensor (4) that is adapted for sensing mechanical stress in the nut, and for providing a signal representing the stress, for transmission to an external recording device.
2. A device according to claim 1, characterised in that the nut (1) is a standard hexagonal nut that is provided with a number of diametrically opposite recesses (3) in
15 pairs.
3. A device according to claim 1 or 2, characterised in that the recess or recesses (3) is/are placed approximately mid-way between the upper and lower side of the nut (1), and has/have a depth corresponding to approximately half the wall thickness of the nut.
4. A device according to any of the claims 1-3, characterised in that the nut (8)
20 is shaped with a spherically convex abutment surface (9) that is adapted for abutment against a corresponding concave surface of the relevant support.
5. A device according to any of the claims 1-3, characterised in that the nut (10) is shaped with a spherically concave abutment surface (11) that is adapted for abutment against a corresponding convex surface (12) of the relevant support (13).
- 25 6. A device according to any of the preceding claims, characterised in that the sensor (4) is a so-called SAW sensor (SAW = Surface Acoustic Wave) which can be excited and read by radio, and which is provided with an appurtenant antenna (7).
7. A device according to claim 6, characterised in that the antenna (7) is fit into the outer peripheral surface (2) of the nut (1) or in its top surface.
- 30 8. A device according to claim 6 or 7, characterised in that the sensor (4) is arranged to receive energy from the recording device at a tuned radio frequency, and to deliver a signal representing the stress condition in the nut (1).
9. A device according to any of the claims 6-8, characterised in that each sensor (4) is provided with an ID code, for enabling communication with several sensors within
35 the same region.